



Rivet, Analyses and Distributions

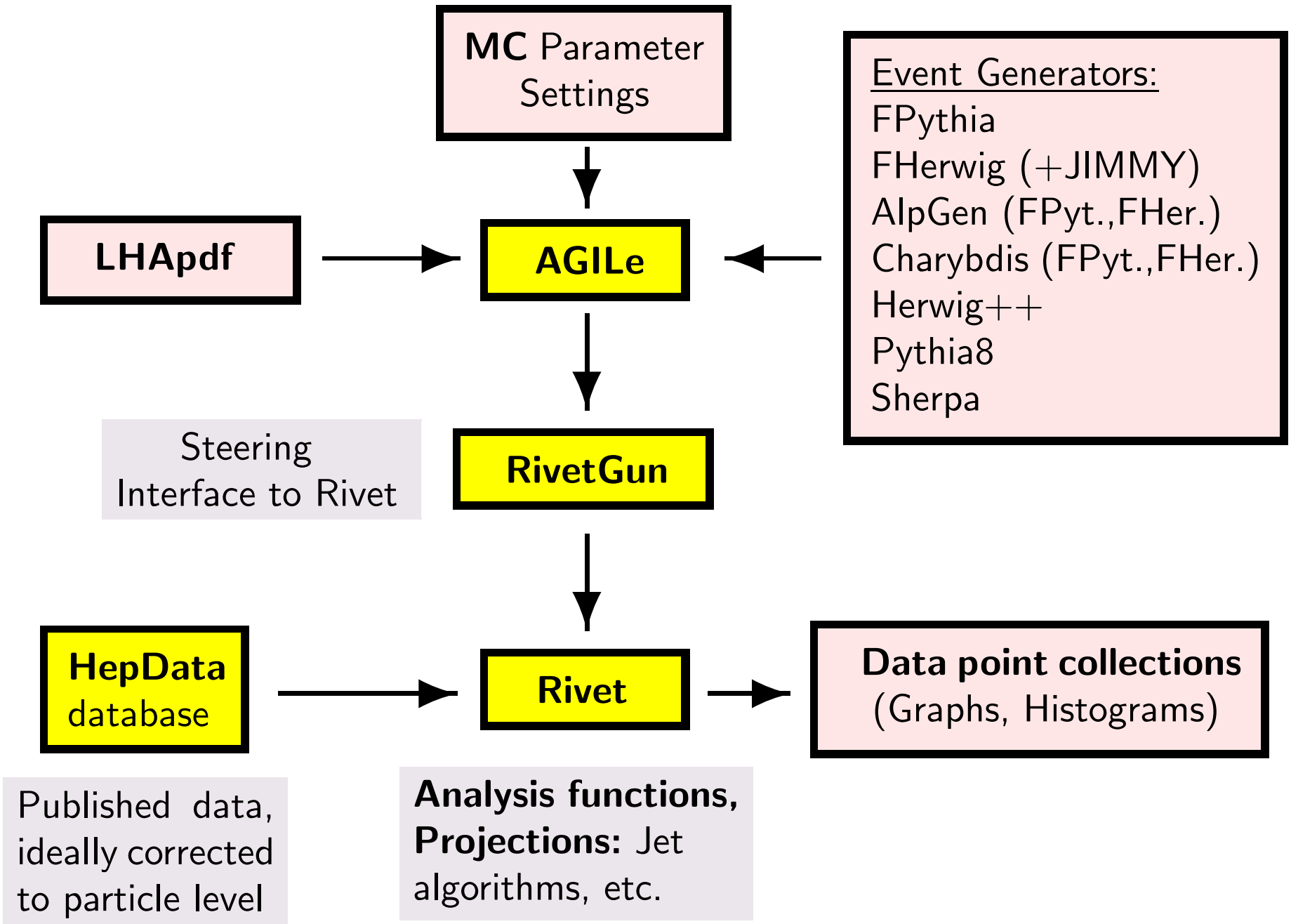


Lars Sonnenschein

- Introduction
- Analyses and distributions
- Conclusions

This work has been supported by a Marie Curie Early Stage Research Training Fellowship of the European Community's Sixth Framework Programme under contract number MRTN-CT-2006-035606, by LPNHE Paris and the *Commissariat à l'Energie Atomique* and *CNRS/Institut National de Physique Nucléaire et de Physique des Particules*, France and by the HEPtools EU Marie Curie Research Training Network under the contract number MRTN-CT-2006-035505.

Validation of Experiment and Theory



Rivet Analyses

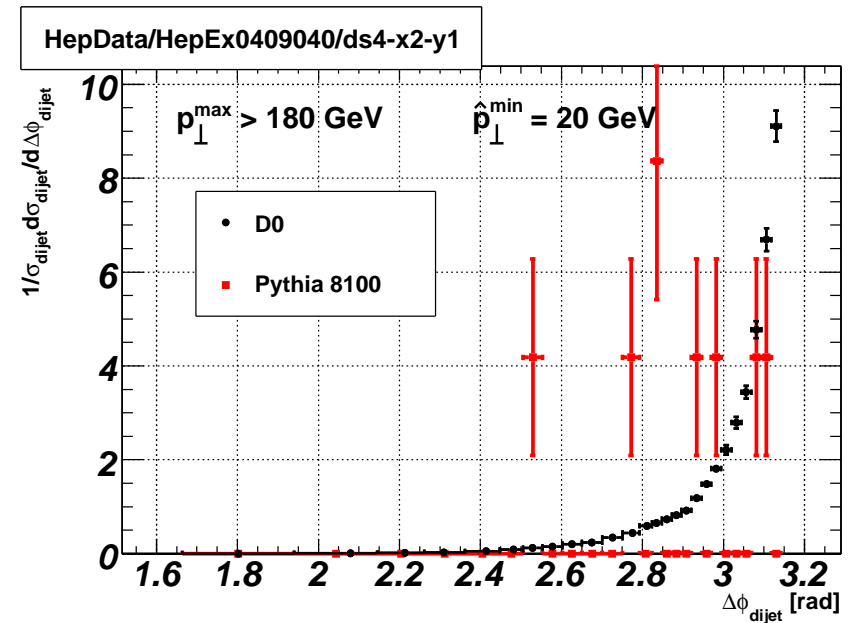
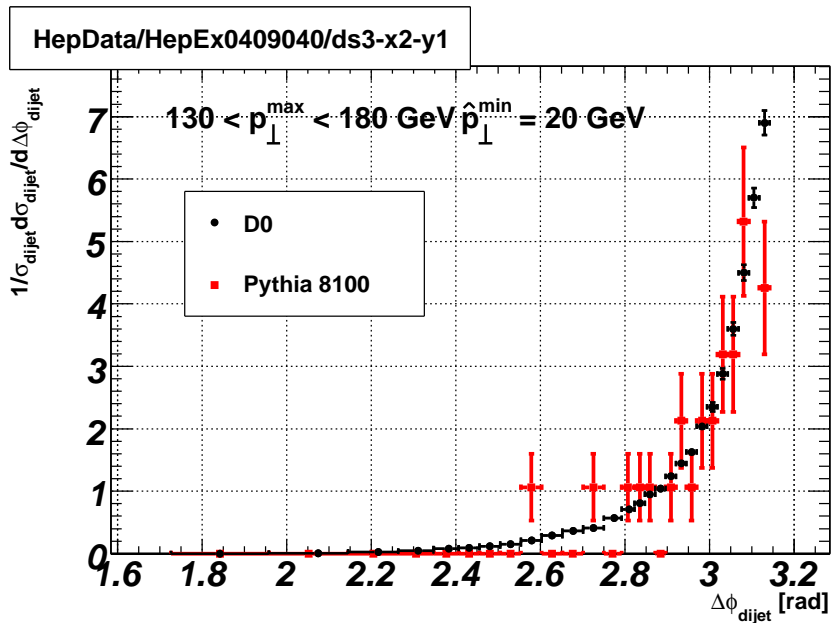
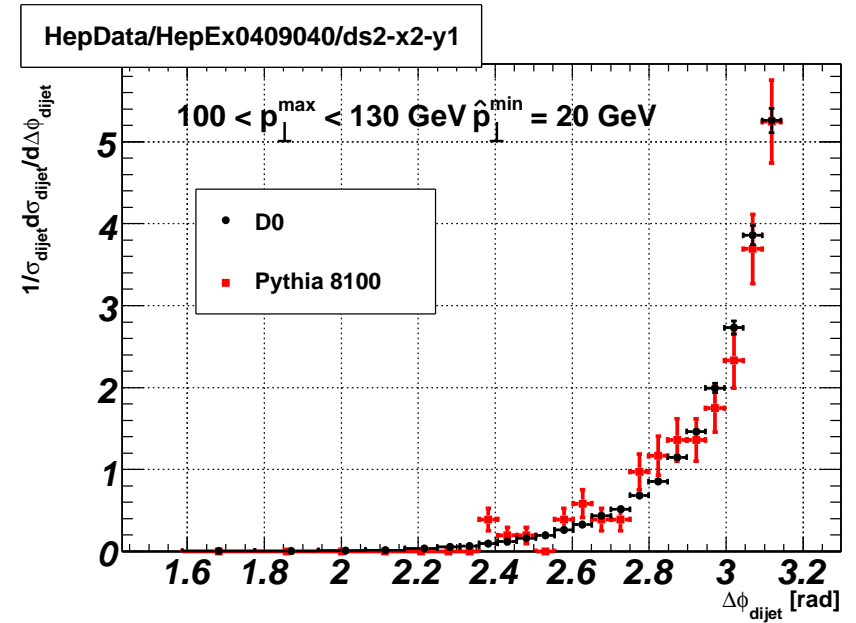
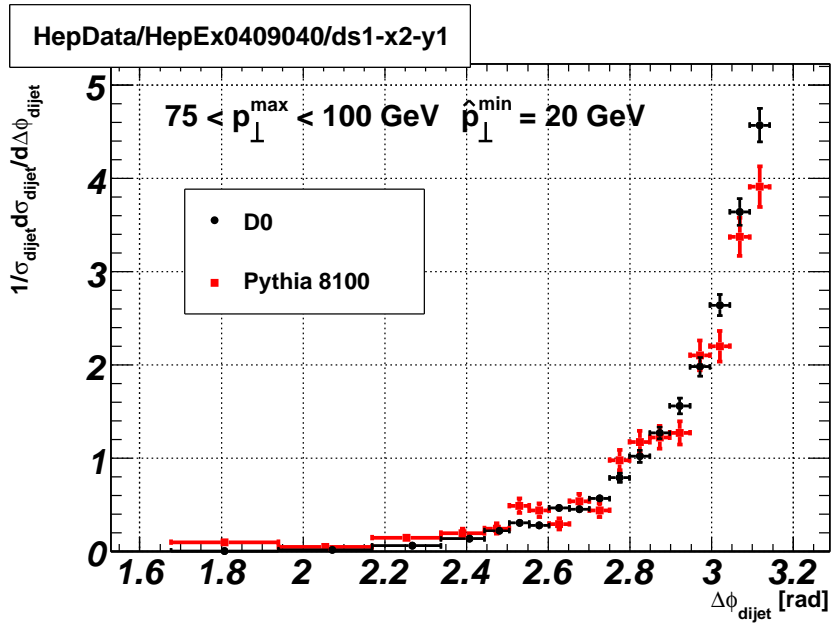
Published analyses already implemented:

- ALEPH_1991_S2435284: Charged particle multiplicity
- DELPHI_1996_S3430090: Event shapes
- CDF_1994_S2952106: Color coherence
- CDF_2001_S4751469: Field & Stuart, Underlying event
- D0_2001_S4674421: Differential W/Z boson cross section
- D0_2004_S5992206: Azimuthal dijet decorrelations
- CDF_2005_S6217184: Jet Shapes
- CDF_2006_S6653332: $Z + b$ jet production
- CDF_2007_S7057202: Inclusive k_{\perp} jet cross section
- H1_1995_S3167097: Energy flow in DIS
- ZEUS_2001_S4815815: Dijet photoproduction (used for p.d.f. fit)
- External user analysis plugging mechanism available

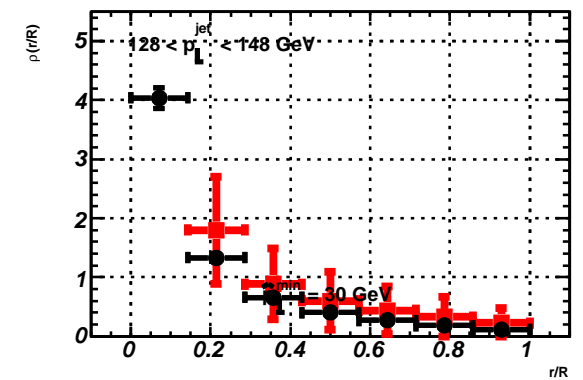
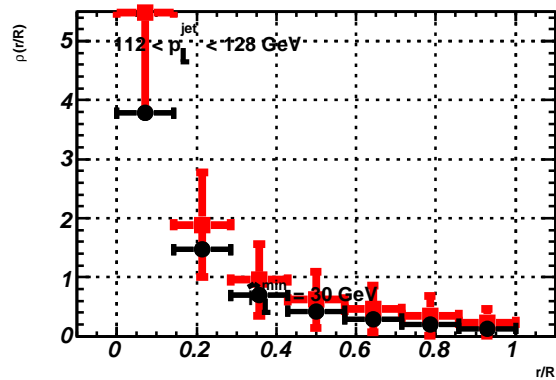
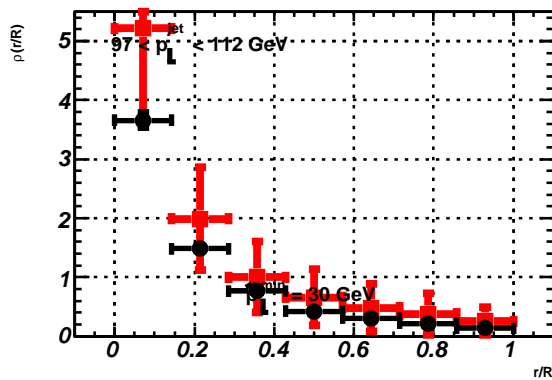
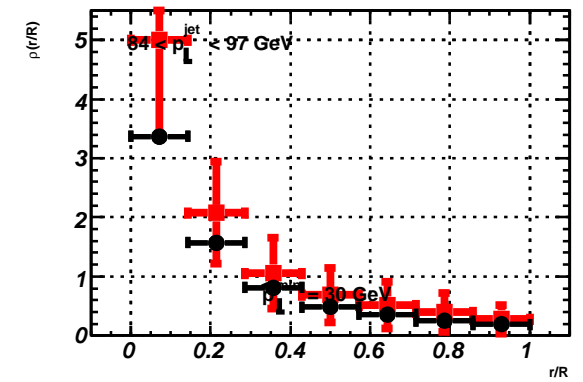
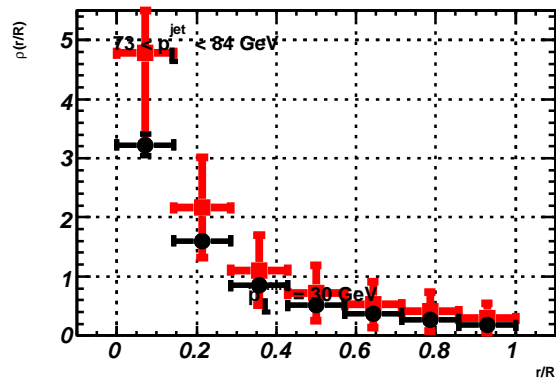
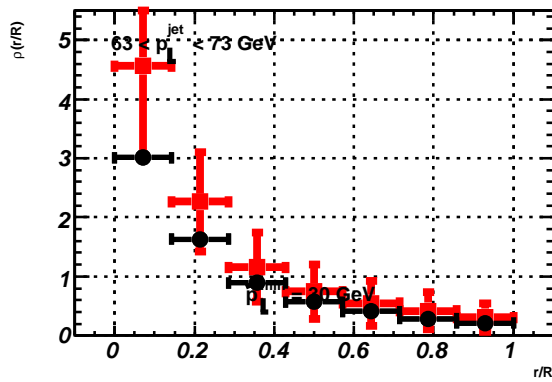
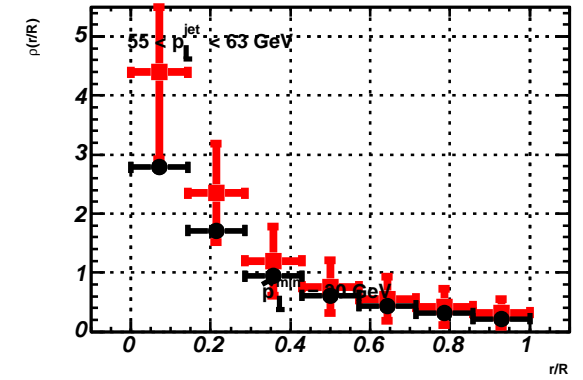
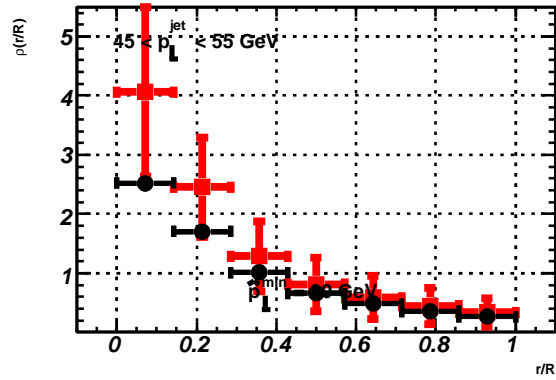
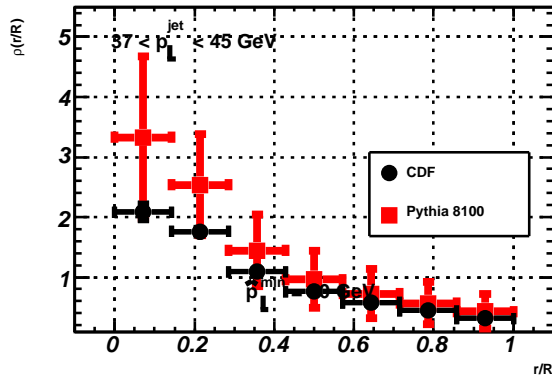
Rivet Distributions

- Projections determine observables
- Data come with Rivet, extracted from HepData database
- Simulation example: Pythia 8100, default parameters
- Primary purpose here demonstration of availability, NOT comparison
- More systematic studies with JetWeb and Professor
- Exploiting Rivet capability to write out files in Root format

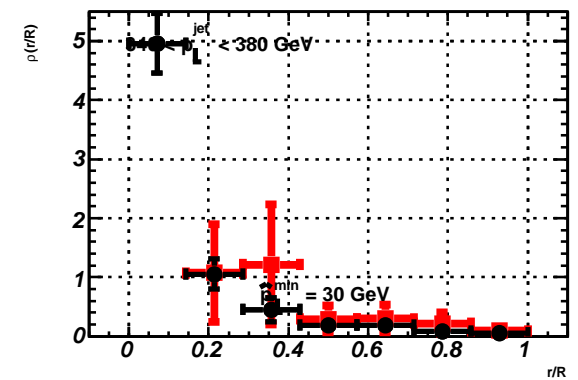
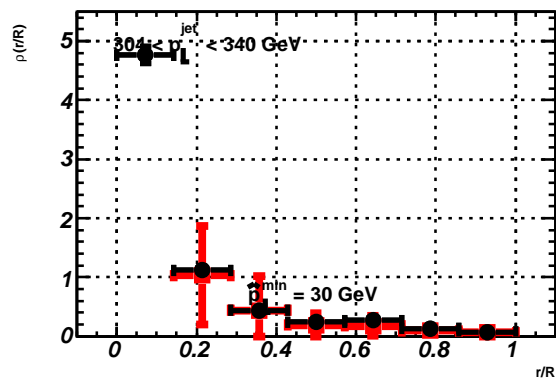
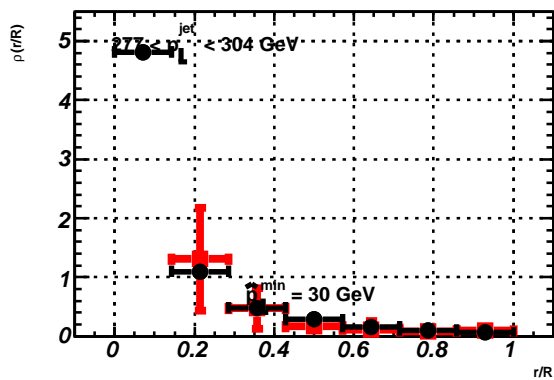
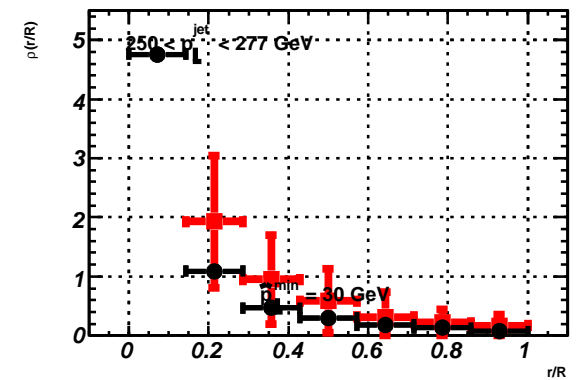
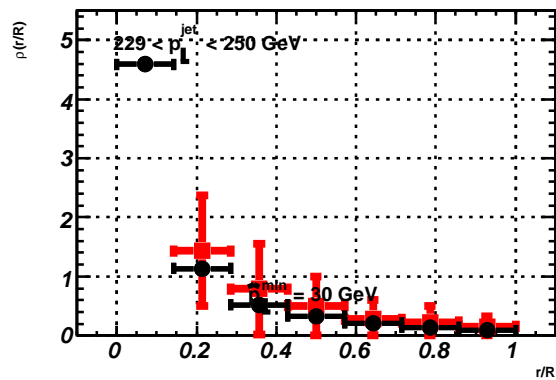
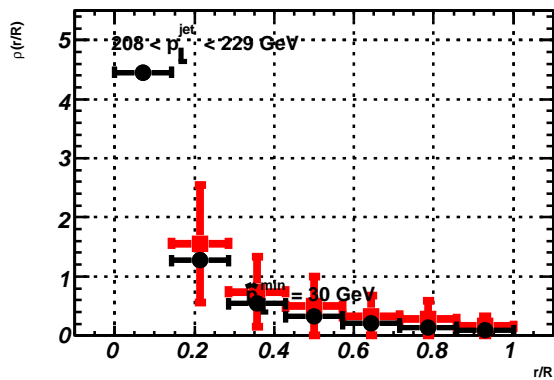
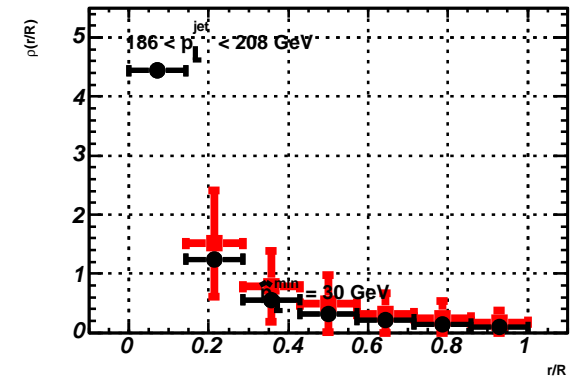
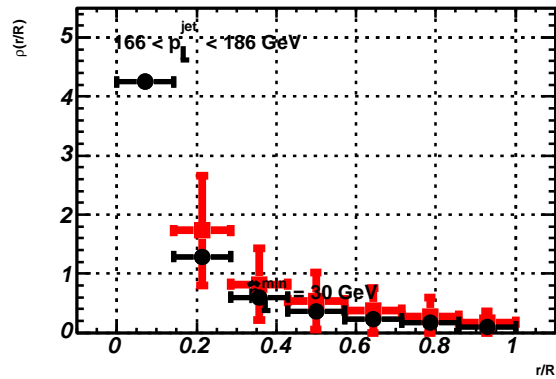
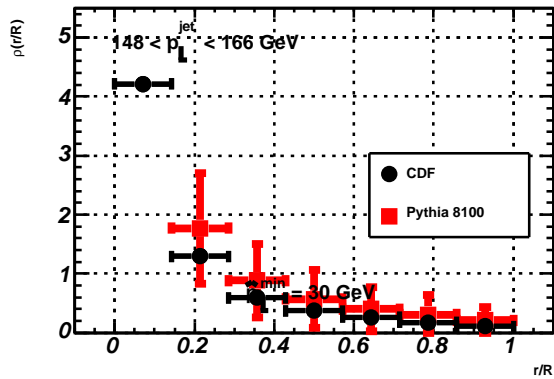
Rivet Analysis D0_2004_S5992206: Azimuthal dijet decorrelations



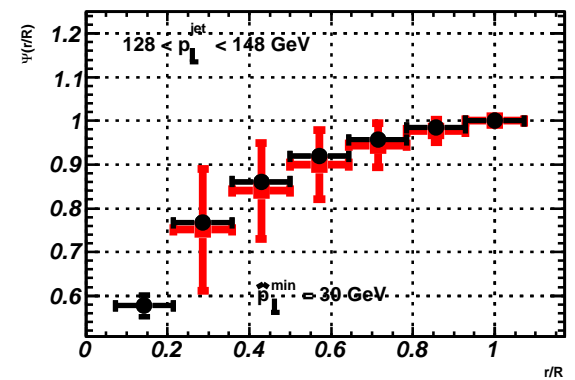
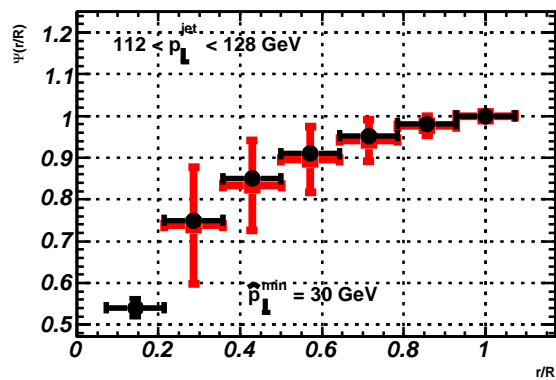
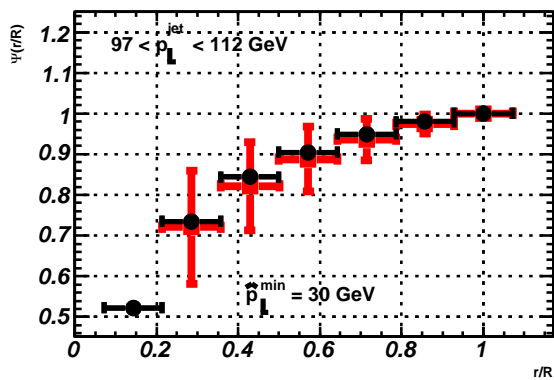
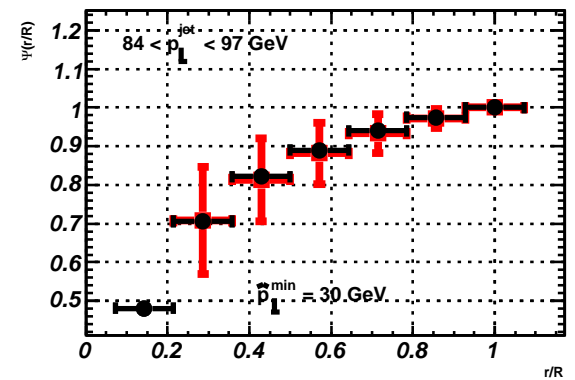
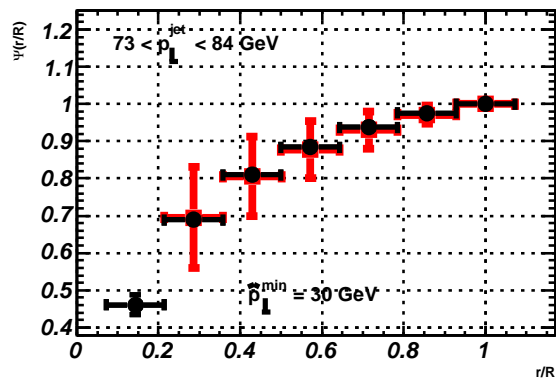
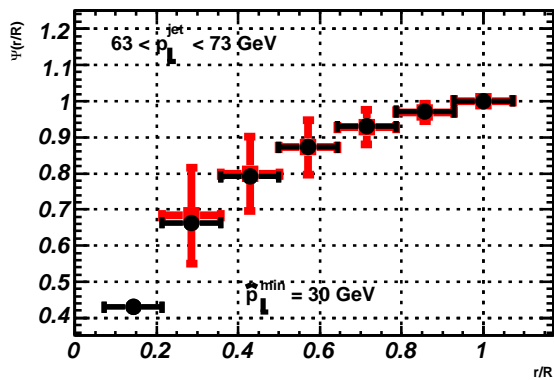
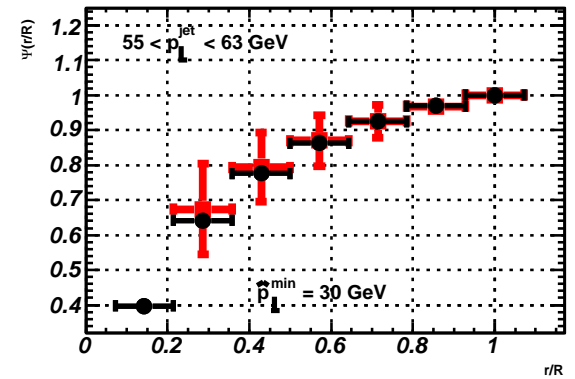
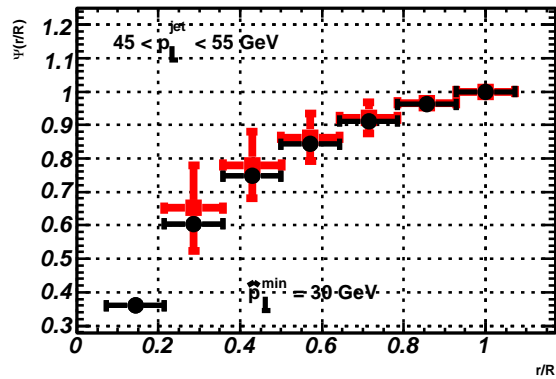
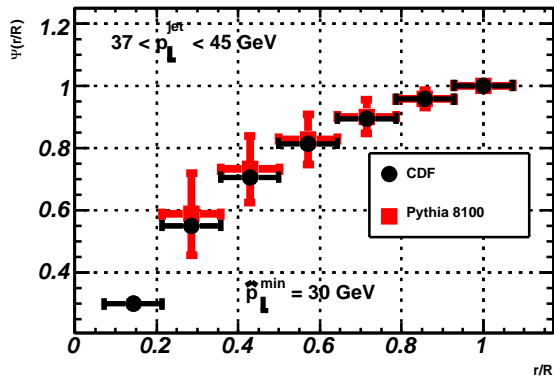
Rivet Analysis: CDF_2005_S6217184: Jet Shapes ρ , $37 < p_{\perp}^{\text{jet}} < 148$



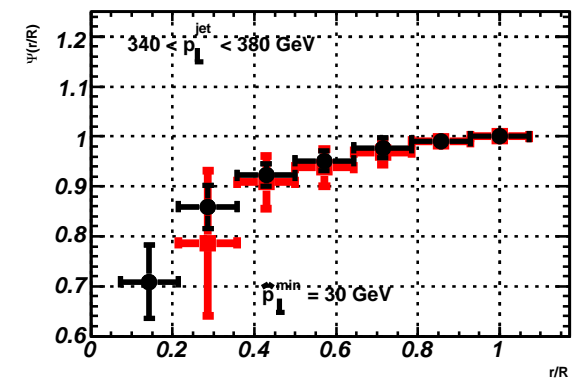
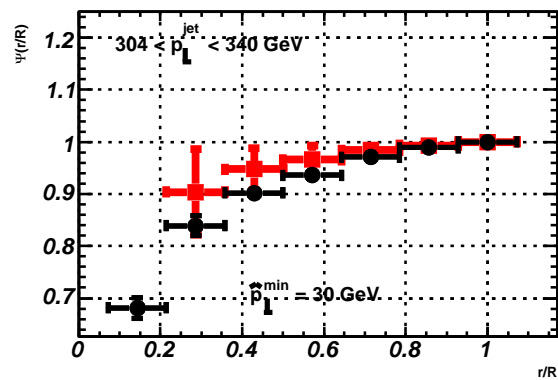
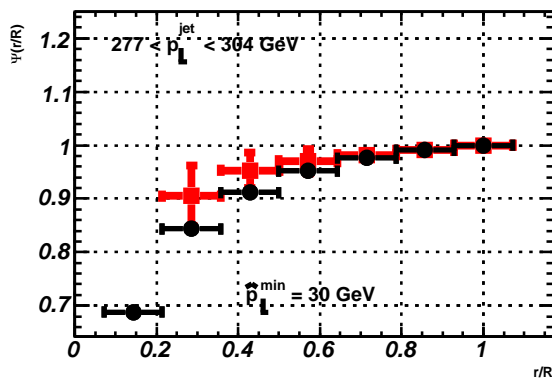
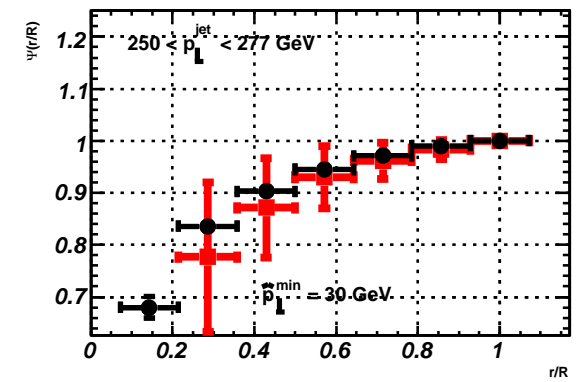
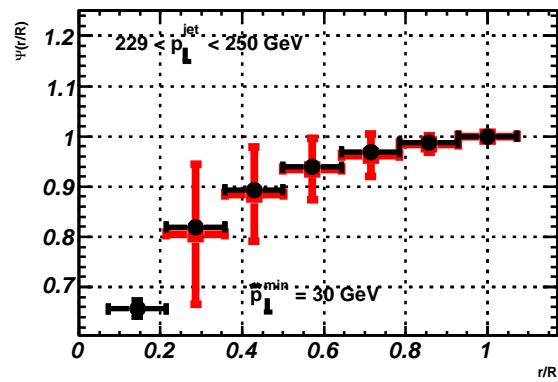
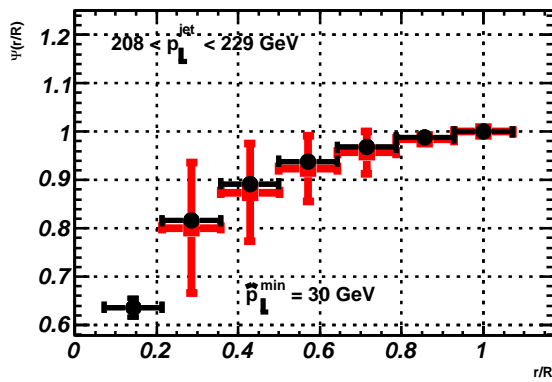
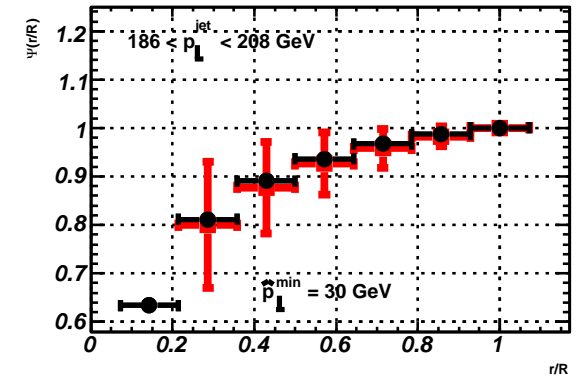
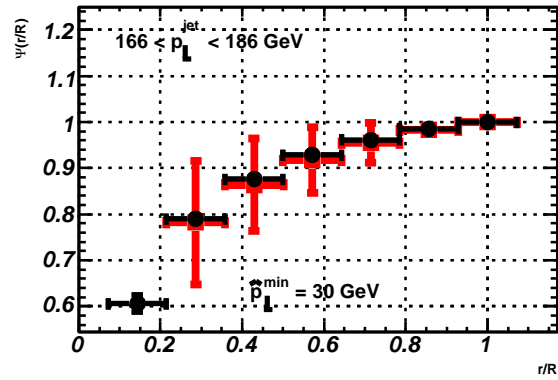
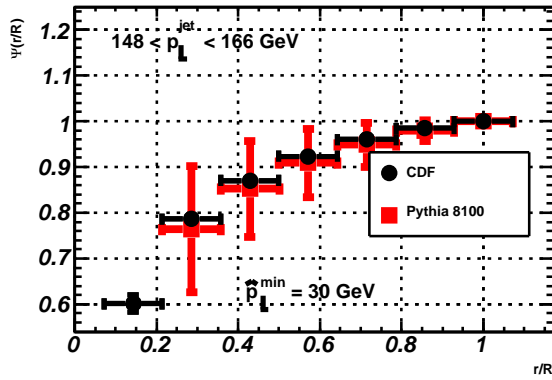
Rivet Analysis: CDF_2005_S6217184: Jet Shapes ρ , $148 < p_{\perp}^{\text{jet}} < 380$



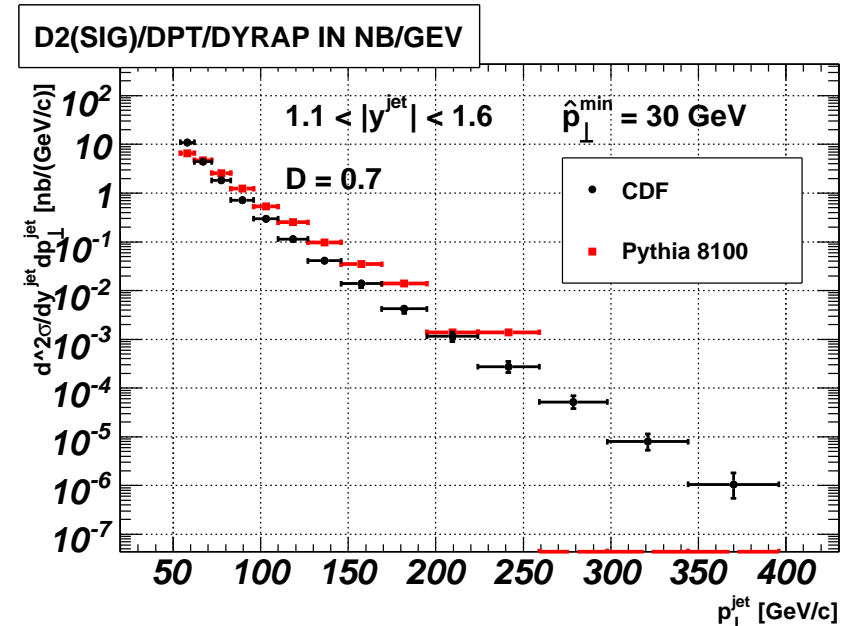
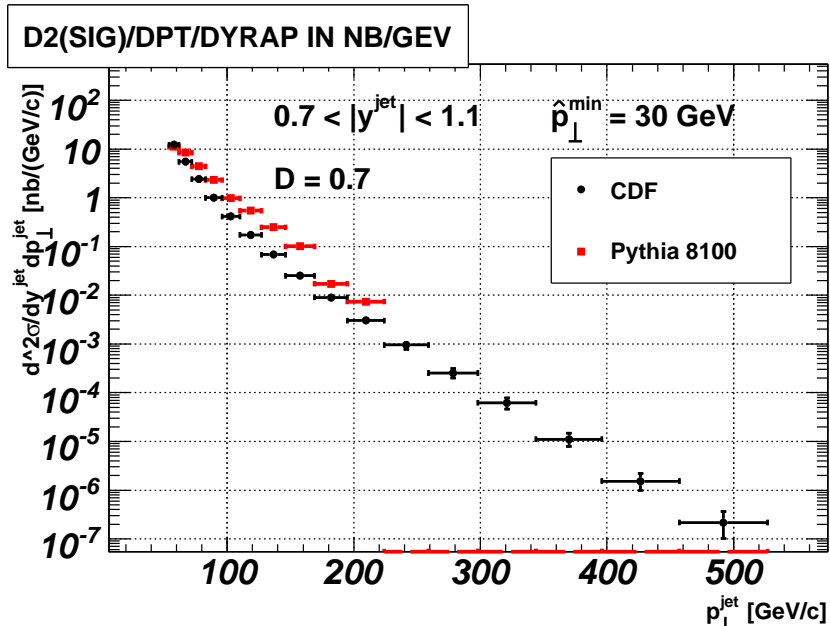
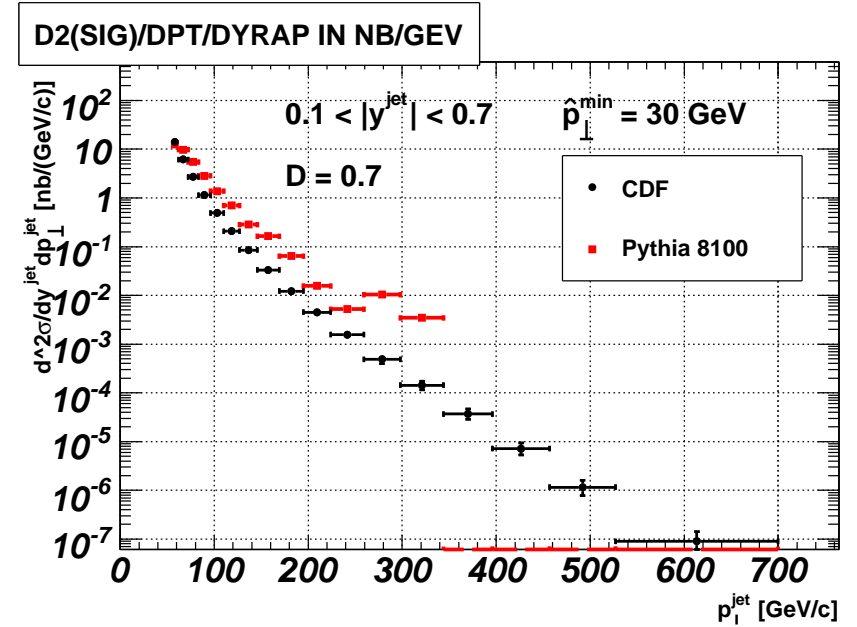
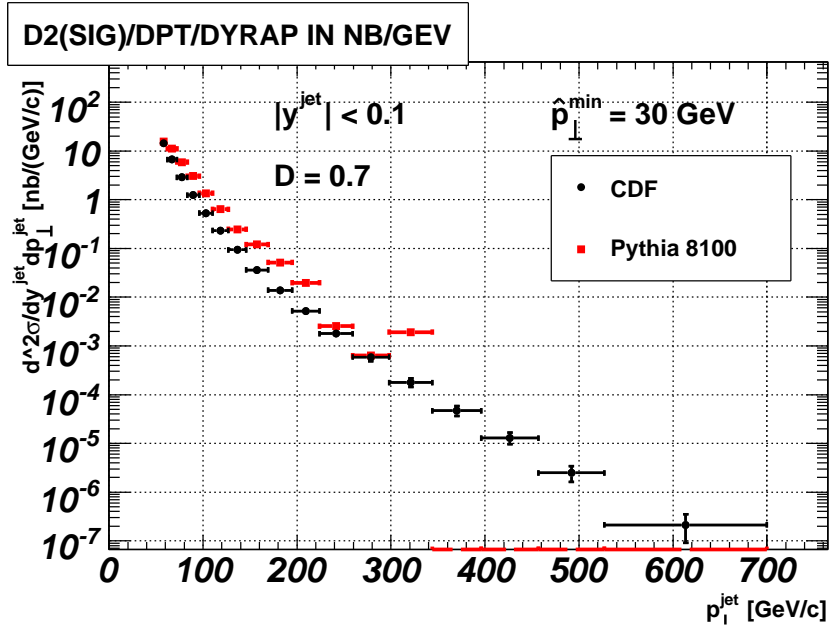
Rivet Analysis: CDF_2005_S6217184: Jet Shapes ψ , $37 < p_{\perp}^{\text{jet}} < 148$



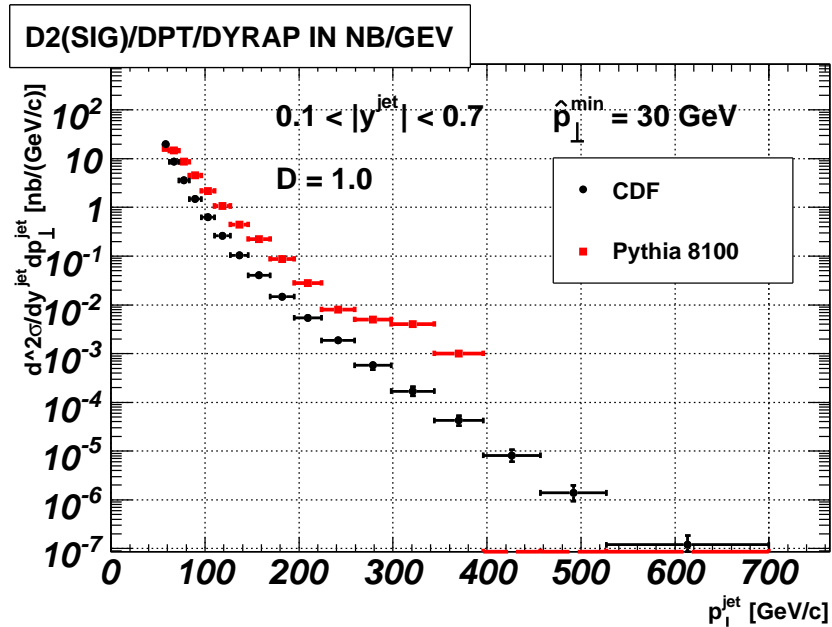
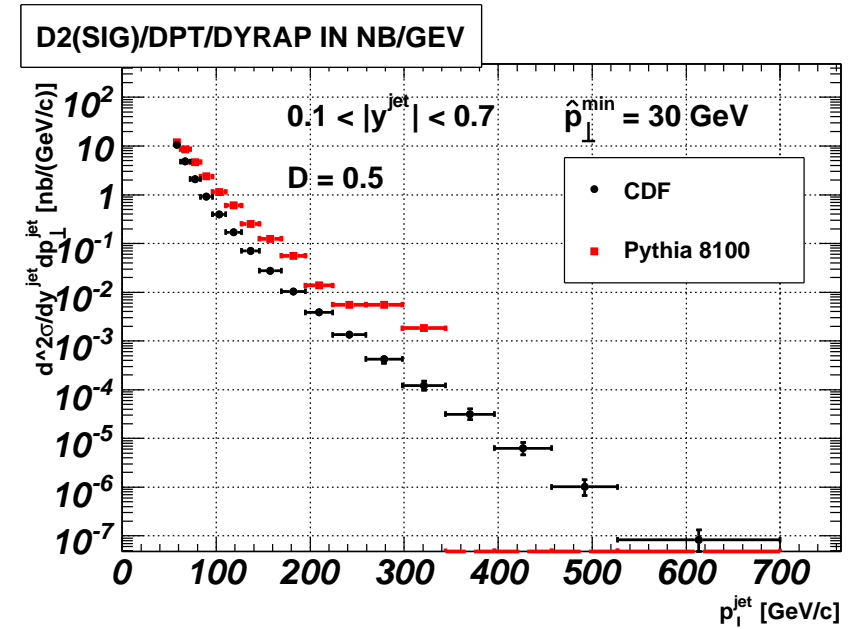
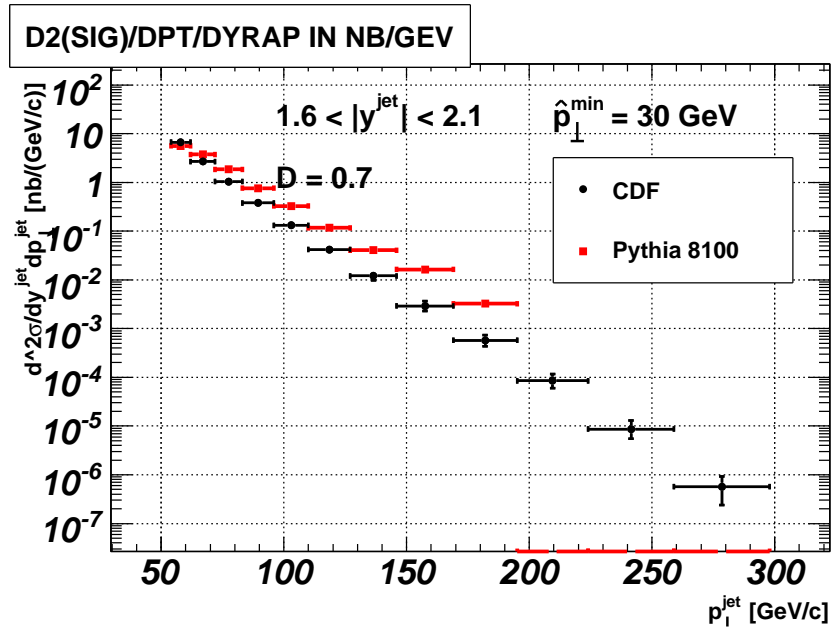
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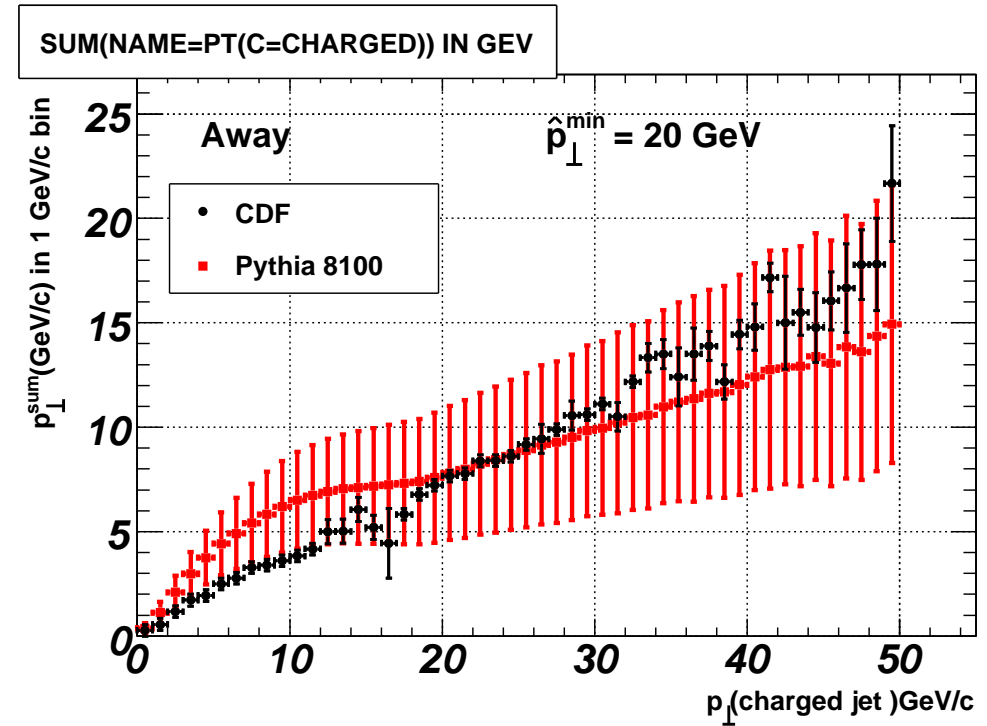
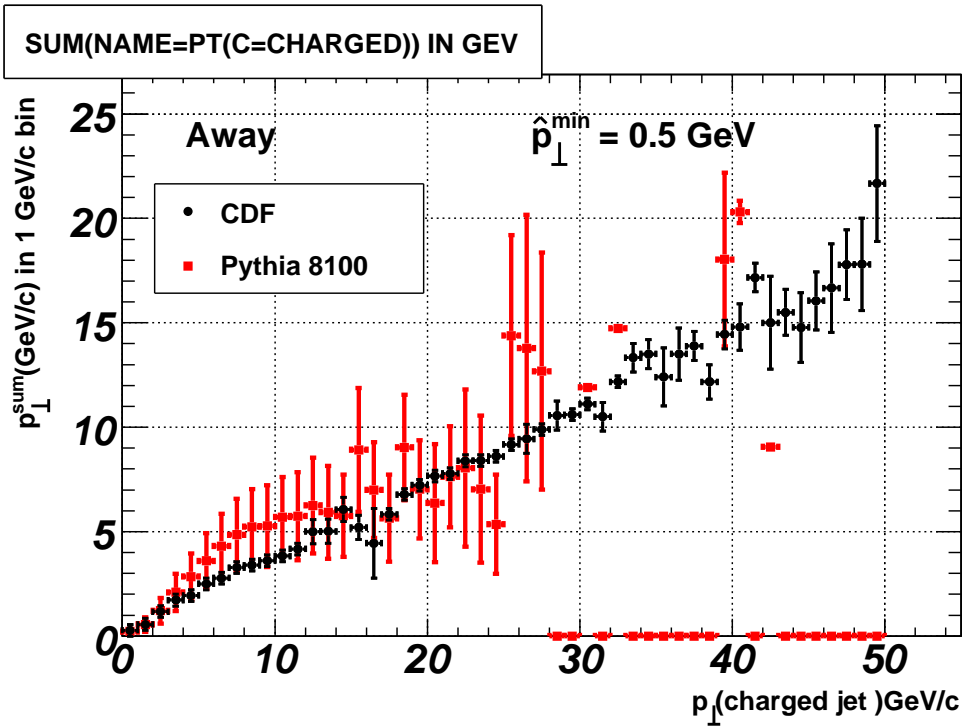
Rivet Analysis: CDF_2007_S7057202: Inclusive k_{\perp} jet cross section



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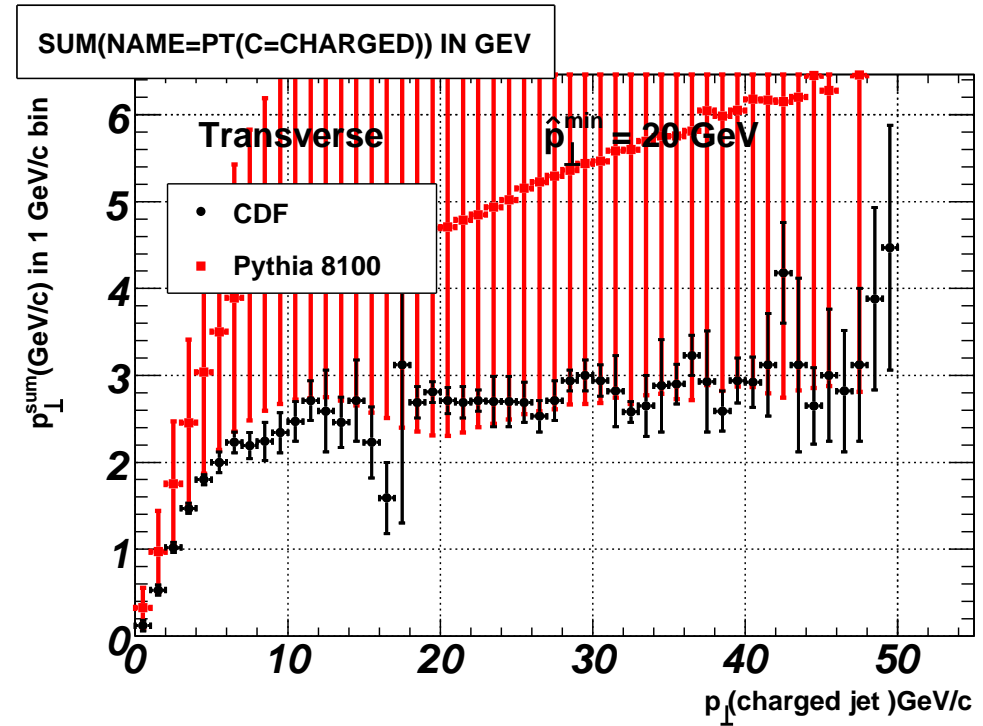
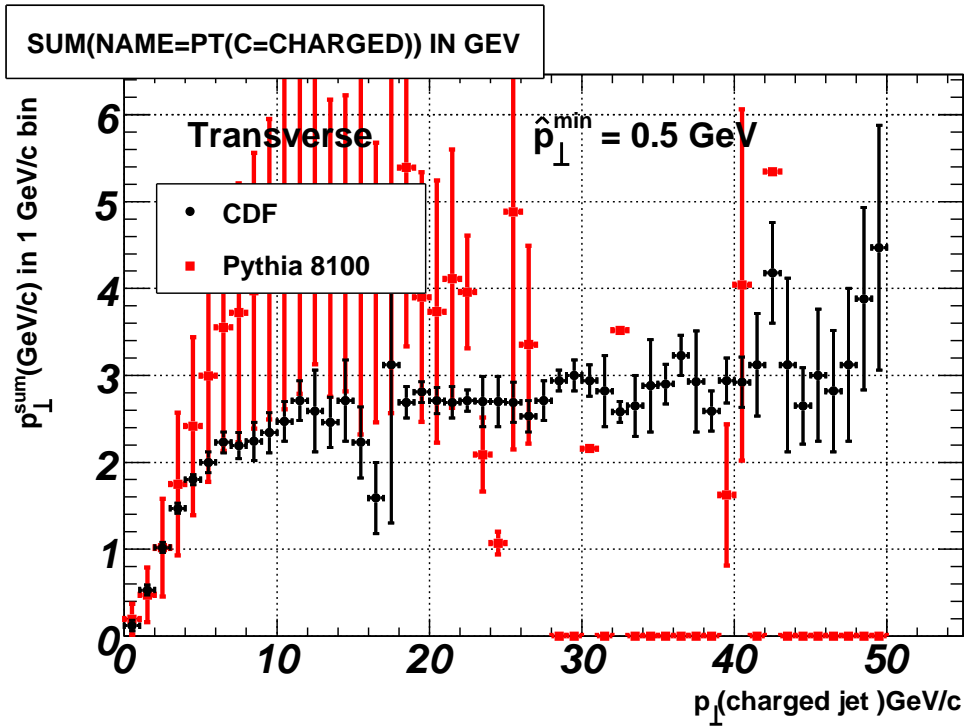


Away region



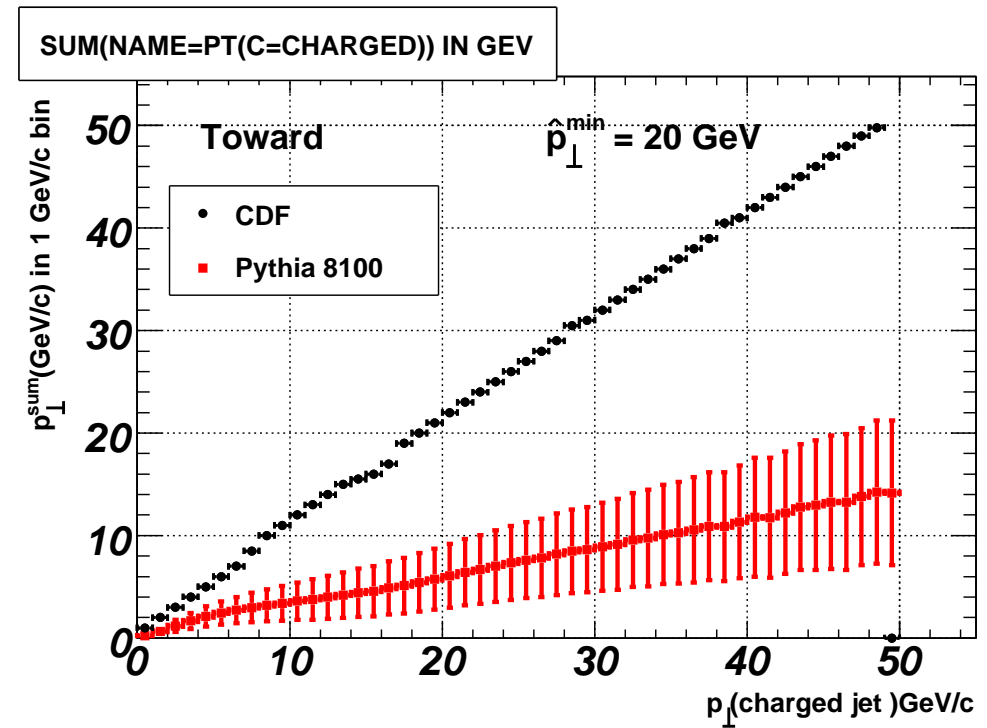
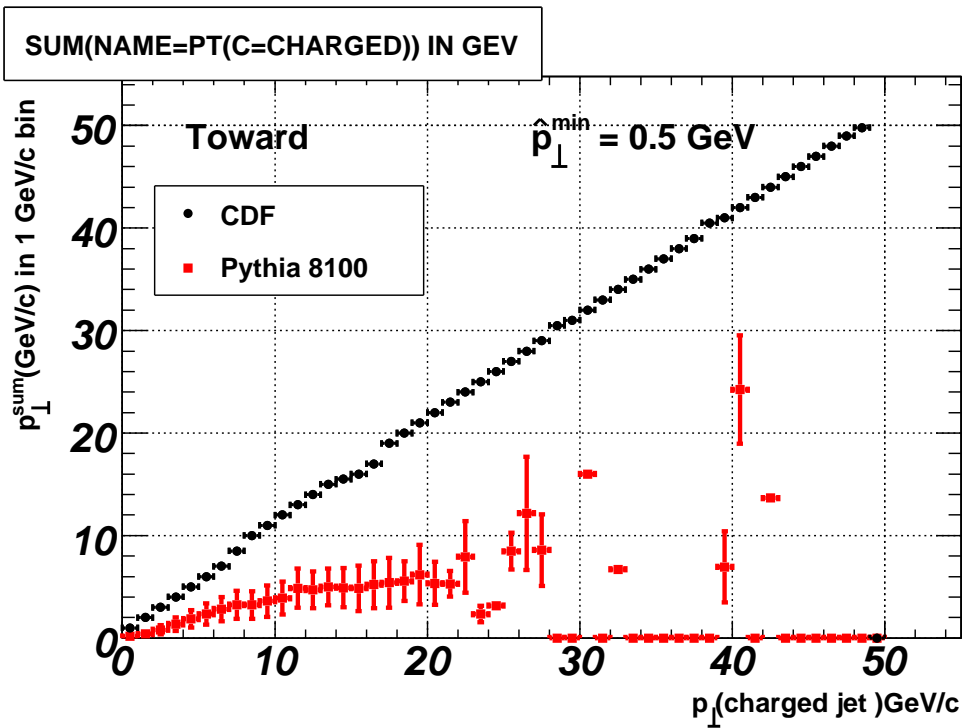
Need to launch different \hat{p}_{\perp}^{\min} runs to get left and right side of histogram reasonably filled

Transverse region



Need to launch different \hat{p}_{\perp}^{\min} runs to get left and right side of histogram reasonably filled

Toward region



Need to launch different \hat{p}_{\perp}^{\min} runs to get left and right side of histogram reasonably filled

Conclusions

- HepData database being used
- Rivet functionality is growing
 - Physics validation and analysis framework
 - Many analyses are already in, more being implemented
 - Being used by GENSER (LHC Computing Grid subproject)
 - Next release soon
- JetWeb and Professor are making use of Rivet